UNITED STATES PATENT AND TRADEMARK OFFICE

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/663,585	09/18/2000	Volker Stahl	PHD 99-124	4107

				EXAMINER
24737	7590	03/26/2004		STORM, DONALD L

PHILIPS INTELLECTUAL PROPERTY & STANDARDS
P.O. BOX 3001
BRIARCLIFF MANOR, NY 10510

ART UNIT	PAPER NUMBER
2654	

DATE MAILED: 03/26/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

	Application No.	Applicant(s)
Office Action Summary	09/663,585	STAHL ET AL.
	Examiner	Art Unit
	Donald L. Storm	2654

-- *The MAILING DATE of this communication appears on the cover sheet with the correspondence address --*

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE _3_ MONTH(S) FROM
THE MAILING DATE OF THIS COMMUNICATION.
- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed
  after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
  Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any
  earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *September 18, 2000 through July 8, 2002*.

2a)☐ This action is **FINAL**.   2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is
closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) _1-6_ is/are pending in the application.

    4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) _1-6_ is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *18 September 2000* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

    Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

    Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

    a)☒ All   b)☐ Some * c)☐ None of:

      1.☒ Certified copies of the priority documents have been received.

      2.☐ Certified copies of the priority documents have been received in Application No. _____.

      3.☐ Copies of the certified copies of the priority documents have been received in this National Stage
application from the International Bureau (PCT Rule 17.2(a)).

    * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1)☒ Notice of References Cited (PTO-892)

2)☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)

3)☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _4_.

4)☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ .

5)☐ Notice of Informal Patent Application (PTO-152)

6)☐ Other: _____.

DETAILED ACTION

Information Disclosure Statement

1.   A copy of the search report of the European Patent Office (paper 7) is present in the

application file, and it has been considered by the Examiner.

Specification

2.   The Examiner notes, without objection, the possibility of informalities in the abstract. It is

in the best interests of the patent community that the Applicant be aware of these editorial

situations and consider changes during normal review and revision of the abstract:

The phrase "Fig. 4" (4th paragraph) is unconnected to the subject matter. It lengthens the

abstract unnecessarily. Its intent is ambiguous when not accompanied by appropriate figures.

3.   The Examiner notes, without objection, that this application is informal in the arrangement

of the specification. The following guidelines illustrate the preferred layout and content for patent

applications, and items should appear in upper case, without underlining or bold type, as section

headings. It is in the best interests of the patent community that the Applicant be aware of these

editorial situations and consider changes during normal review and revision of the disclosure.

In current Office practice, explained in MPEP § 608.01(a), the specification should

contain:

TITLE OF THE INVENTION: at the top of the first page of
                    the specification,
REFERENCE TO COMPACT DISC: if applicable, see 37 CFR
                    1.52(e)(5)
BACKGROUND OF THE INVENTION: two parts,
        FIELD OF THE INVENTION: may also be titled "Technical
        Field,"
        DESCRIPTION OF THE RELATED ART: may also be titled "Background Art,"

BRIEF SUMMARY OF THE INVENTION:
BRIEF DESCRIPTION OF THE DRAWINGS:
DETAILED DESCRIPTION OF THE INVENTION:
CLAIM or CLAIMS: commence on separate sheet or
electronic page, each element or step of the claim should be separated
by a line indentation; there may be plural indentations to further
segregate subcombinations or related steps,
ABSTRACT OF THE DISCLOSURE: on a separate sheet, narrative
of the claimed matter.

Claim Informalities

4.   Claim 6 is objected to because the scope must be interpreted when the symbols making up

the claim limitations are not defined in the claim. The symbol "8" (line 2) should be defined in

the claims at least the first time used, if a concise and accurate definition is available. The

definition --controlled system function units combination-- seems appropriate; see page 14 of the

specification.

5.   The form of the claims does not follow Office practice. While there is no set statutory

form for claims, the present Office practice is to insist that each claim must be the object of a

sentence starting with "I (or we) claim", "The invention claimed is", or the equivalent. The

Applicant is encouraged to insert a desired introduction before claim 1. If, at the time of

allowance, appropriate terminology is not present, it is inserted by the technical staff. See

MPEP § 608.01(m).

6.   The Examiner notes, without objection, the possibility of informalities in the claims. The

Applicant may wish to consider changes during normal review and revision of the disclosure.

        a.   In claim 4, line 1, should the phrase "one of the claim 3" be --claim 3--?

        b.   In claim 5, line 5, should the phrase "more particularly" be omitted?

c.   In claim 6, lines 2-3, should the phrase "one of the claim 5" be --claim 5--?

Claim Rejections - 35 USC § 103

7.   The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

Junqua and Fujisaki

8.   Claims 1-3 are rejected under 35 U.S.C. 103(a) as being unpatentable over Junqua et al. [US Patent 5,799,065], already of record, in view of Fujisaki et al. [US Patent 5,392,363].

9.   Regarding claim 1, Junqua [see Fig. 5] and Fujisaki make a speech recognition embodiment recognizable as a whole to one versed in the art by explicitly describing the content and functionality of the recited limitations as the following terminology. In particular, Junqua describes:

a letter-sequence estimating stage using a letter speech recognition unit based on HMM [at column 8, lines 55-66, as represent N-best possible spelled combinations of letters analyzing by HMM speech recognition as each letter is spoken];

a post-processing stage for the estimated letter sequence using a statistical letter sequence

model for the speech recognition [at column 7, line 62-column 8, line 11, as a predefined letter

grammar of pairs of letters and associated probability used in decoding the speech into letter

hypotheses by the speech recognizer];

a post-processing stage for the estimated letter sequence using a statistical model for the

speech recognition [at column 10, line 57-column 11, line 12, as highly constrained alignment to

evaluate the N-best hypotheses by DP alignment using HMM];

using dynamic programming during post-processing [at column 10, lines 60-63, as

dynamic programming alignment compares the N-best hypotheses resulting from the recognizer];

dynamic programming is based on a grid with nodes for assigning accumulated probability

values [see Fig. 9, axes, hypotheses points, and their description, especially at column 15, lines 6-

23, as the N-best hypotheses analysis as the lattice technique that computes and saves the

propagated likelihood for each grammar node];

the grid is converted into a tree [see Fig. 16, items n1, w1, na, etc. their connections, and

their descriptions especially at column 12, lines 32-62, as prioritize the ending nodes as the

vertical column, expand the node to the hypothesis that generated the node, in turn identify the

node that generated the hypothesis, proceed in that manner until a starting node is identified];

use an algorithm for finding an optimum tree path [at column 12, line 36-column 13, line

2, as the backtracking algorithm sorts and substitutes higher scoring nodes such that the string

through the first nodes in the queue represents the hypothesis with the highest score when a

starting node has been found].

However, Junqua does not explicitly describe the using the A* algorithm.

Fujisaki [see Fig. 27] describes an embodiment of recognition of letters of the alphabet using a tree structure corresponding to paths through a Viterbi lattice. Fujisaki also describes:

use an algorithm for finding an optimum tree path [at column 20, lines 22-61, as operate a search method to access a d-node of the vocabulary trie to determine probabilities and the maximum probability corresponding to the associated path];

use the A*algorithm [at column 17, lines 41-62, as the beam search technique is referred to as algorithm A*].

Fujisaki [at column 17, lines 34-43] points out the A* algorithm is a preferred beam search technique because of its efficiency. It would have been obvious to one of ordinary skill in the art of dynamic programming at the time of invention to include the A* algorithm with Junqua's DP search because Fujisaki shows its suitability in that role and that would bring the known A* search efficiencies to Junqua's beam search.

10.   Regarding claim 2, Junqua also describes:

determining sub-optimum tree paths for the utterance corresponding to N best estimates with N>1 [at column 8, lines 17-50, as yield the N-best hypotheses that deviate from the best score no more that a beam width any N greater than 1].

11.   Regarding claim 3, Junqua also describes:

during the search tree paths that have a small probability compared other tree paths are preferably no longer followed [at column 8, lines 46-50, as implements a beam search whereby the least likely search paths are pruned so that only the best hypotheses are returned];

the small probability is already at the beginning of the search [at column 9, lines 7-10, as

prune paths that represent low probability from the beginning of the utterance to the last letter

found].

Junqua and Fujisaki and Cecinati

12.   Claim 4 is rejected under 35 U.S.C. 103(a) as being unpatentable over Junqua et al. [US

Patent 5,799,065], already of record, in view of Fujisaki et al. [US Patent 5,392,363] and Cecinati

et al. [US Patent 4,907,278].

13.   Regarding claim 4, Junqua [at Fig. 5 and column 3, line 67] also describes DSP

implementation of the speech recognition functions that are described as separate functional

blocks. Fujisaki [at Fig. 3 and columns 8-9] describes an implementation on a general purpose

computer of the functional blocks of the recognizer. Although Fujisaki suggests different

implementation mechanisms for the functions of the recognizer, neither Fujisaki nor Junqua

explicitly describes first and second ICs implementing different functions of the processing.

Cecinati [at column 9, lines 61-66] also describes HMM speech recognition using

dynamic programming. Cecinati also describes:

a first processing stage [at column 5, lines 1-5, as a master that supplies a list of data

relative to grammar arcs to be searched by a slave];

a second processing stage [at column 5, lines 1-11, as slave processes that supply

hypotheses and a list of surviving paths that were not pruned form a list of data relative to

grammar arcs that were supplied by a master to be searched by a slave];

a first IC for the first stage and a second IC for the second stage [at column 1, lines 7-20,

as a higher-level master integrated circuit and a lower-level slave integrated circuit].

Cecinati [at column 1, lines 24-46] points out that the division of processing is

advantageous to providing real-time speech recognition because the processing can be started as

parts of the utterance are received, rather than waiting until its ending. It would have been

obvious to one of ordinary skill in the art of digital signal processing at the time of invention to

include Cecinati's concept of faster processing by separating the different functions of Junqua's

and Fujisaki's recognition processing onto a first and a second IC because the results could be

determined faster by processing the different functions, corresponding to preceding and following

portions of the utterance data, at the same time as the characters are entered.

Junqua and Fujisaki and Attwater

14.   Claims 5/2/1, 5/3/1, and 5/1 are rejected under 35 U.S.C. 103(a) as being unpatentable over

Junqua et al. [US Patent 5,799,065], already of record, in view of Fujisaki et al. [US Patent

5,392,363] and Attwater et al. [US Patent 5,940,793].

15.   Regarding claim 5, Junqua and Fujisaki describe only spelled recognition of database

words (names). Neither Junqua nor Fujisaki explicitly describes inputting and recognizing a

whole word.

Attwater [at column 8, lines 10-25] describes an embodiment for spelled word recognition

of database words (names). Like Junqua and Fujisaki, Attwater [at column 5, lines 24-55] uses a

decoding tree structure and the Viterbi algorithm. In addition, Attwater describes:

a speech word is input and the whole word is recognized [at column 6, lines 28-41, as the name of a town is received from a telephone call by the recogniser and the recogniser communicates the name of the town that most closely resembles the received reply];

the whole word serves as a control signal [at column 8, lines 10-12 , as the word from earlier recognition generates a list of words to be recognized];

part of this word is input in spelled form and recognized [at column 8, lines 10-25, as receipt of letters of the spelled version of the name for a town name recognition]; and

a vocabulary assigned to the word speech recognition is restricted by the recognition result of the letter speech recognition [at column 8, lines 10-25 , as a list of words for a town name recognition step may be prepared from earlier recognition of letters of the town name].

Attwater [at column 5, lines 49-55] points out that restricting the active subset of the tree to be searched allows resources to be concentrated on the most likely words and should reduce erroneous recognition results. Following Attwater, it would have been obvious to one of ordinary skill in the art of speech recognition at the time of invention to include both word and letter inputs because the resources could be concentrated on the mostly spoken input and errors in recognition results would be lessened.

Junqua and Fujisaki and Cecinati and Attwater

16.   Claim 5/4/3/1 is rejected under 35 U.S.C. 103(a) as being unpatentable over Junqua et al. [US Patent 5,799,065], already of record, in view of Fujisaki et al. [US Patent 5,392,363], Cecinati et al. [US Patent 4,907,278], and Attwater et al. [US Patent 5,940,793].

17.   Regarding claim 5, Junqua and Fujisaki describe only spelled recognition of database

words (names). Like, Attwater, Cecinati [at column 5, lines 1-5] supplies a list of data suitable to

limit the grammar arcs to be searched by a second stage of processing. None of Junqua, Fujisaki,

or Cecinati explicitly describes inputting and recognizing a whole word to restrict spelled word

recognition.

Together, Junqua, Fujisaki, Cecinati, and Attwater describe and make the whole invention

of the claim obvious as indicated elsewhere in this Office action.

Junqua and Fujisaki and Attwater and Davis

18.   Claims 6/5/2/1, 6/5/3/1, and 6/5/1 are rejected under 35 U.S.C. 103(a) as being

unpatentable over Junqua et al. [US Patent 5,799,065], already of record, in view of Fujisaki et al.

[US Patent 5,392,363], Attwater et al. [US Patent 5,940,793], and Davis et al. [US Patent

5,177,685].

19.   Regarding claim 6, Attwater also describes:

a speech controlled electronic device [at column 13, lines 13-23, as a call routing device

with speech recognition to connect a caller to the recipient];

component 8 {controlled system function units combination} [at column 3, lines 34-38, as

host processor, switching logic, and switch].

However, none of Junqua, Fujisaki, or Attwater explicitly describes a more particular

navigation system for motorcars.

Davis [at column 24, lines 45-56] describes a navigation system for automobiles with

error-prone speech recognition. Davis describes:

more particularly, a navigation system for motorcars [at column 3, lines 23-24] as the automobile navigation system.

Following Davis' suggestion and desire for a speech recognition system, it would have been obvious to one of ordinary skill in the art of speech recognition, more particularly in difficult environments, at the time of invention to apply the speech recognition system of Junqua, Fujisaki, and Attwater to Davis' automobile navigation system because the dual recognition would reduce the erroneous results, even in the presence of vehicular noise.

Junqua and Fujisaki and Cecinati and Attwater and Davis

20.   Claim 6/5/4/3/1 is rejected under 35 U.S.C. 103(a) as being unpatentable over Junqua et al. [US Patent 5,799,065], already of record, in view of Fujisaki et al. [US Patent 5,392,363], Cecinati et al. [US Patent 4,907,278], Attwater et al. [US Patent 5,940,793], and Davis et al. [US Patent 5,177,685].

21.   Regarding claim 6, Attwater also describes:

a speech controlled electronic device [at column 13, lines 13-23, as a call routing device with speech recognition to connect a caller to the recipient];

component 8 *{controlled system function units combination}* [at column 3, lines 34-38, as host processor, switching logic, and switch].

However, none of Junqua, Fujisaki, Cecinati, or Attwater explicitly describes a more particular navigation system for motorcars.

Together, Junqua, Fujisaki, Cecinati, Attwater , and Davis describe and make the whole invention of the claim obvious as indicated elsewhere in this Office action.

Conclusion

22.   The following references here made of record are considered pertinent to applicant's

disclosure:

Ito [US Patent 5,067,166] describes speech, character, or spelling recognition that uses a DP grid

to evaluate input sequences against a tree-structured dictionary using a hypothesis stack.

Zhao [US Patent 5,349,645] describes a tree search for word hypotheses and Viterbi beam search

with the grid constrained by the word lattice.

Schwartz et al. [US Patent 5,621,859] describes a sequence of state transitions as a path through a

trellis with the HMM of speech represented as a tree structure with words at the ends of

branches or at nodes.

Oerder [US Patent 5,634,083] describes a dynamic processing grid for comparing test signals to

reference signals corresponding to a word tree natural language model.

Ogawa [US Patent 5,778,405] describes character recognition input of letters spelling words

identified by traversing a character lattice corresponding to a spelling tree and maintaining

a list of recognized words.

Kenny, Hollan, Gupta, Lennig, Mermelstein, and O'Shaughnessy, "A*-Admissible Heuristics for

Rapid Lexical Access," IEEE Trans. Speech and Audio Proc., vol. 1, iss. 1, Jan. 1993, pp.

49-58 describes HMM structures corresponding to a dynamic programming grid and to a

lexical tree evaluated by the A* algorithm constructed using the results of a Viterbi search.

23.   Any response to this action should be mailed to:

> Commissioner for Patents
> P.O. Box 1450
> Alexandria, VA 22313-1450

or faxed to:

(703) 872-9306, (for formal communications intended for entry)

Or:

(703) 872-9306, (for informal or draft communications, and please label "PROPOSED" or "DRAFT")

Hand-delivered responses should be brought to Crystal Park II, 2121 Crystal Drive, Arlington, VA   (Sixth Floor, Receptionist)

24.   Any inquiry concerning this communication or earlier communications from the examiner should be directed to Donald L. Storm, of Art Unit 2654, whose telephone number is (703) 305-3941. The examiner can normally be reached on weekdays between 8:00 AM and 4:30 PM Eastern Time. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Richemond Dorvil can be reached on (703) 305-9645.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Donald L. Storm
Patent Examiner
Art Unit 2654

March 22, 2004